Please replace the paragraph beginning on page 3, line 3 with the following:

a3

One proposed method for dealing with switch state volume is the Multi-Protocol Label Switched (MPLS) architecture, providing for the recursive aggregation of aggregate virtual paths, allowing path labels to be nested in the form of a "label stack". Although the feature appears to be motivated more for switching speed and QoS management, it permits an exponential number of connections to be accommodated at each switch and would reduce the switch state volume to log M. The result could be superior to unaggregated IP in scalability, keeping $\log M < N^{1/d}$, given that the size of the Internet, N, will be greater than the capacity of any one switch, M.

REMARKS

The present preliminary amendment is made to insert the provisional application cross reference data and to more clearly discuss the prior art. No new matter has been added. Entry of the above amendments is respectfully requested.

Respectfully submitted,

By: ______________________

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<u>In the Specification</u>: (Marked-up Version)

<u>This application claims the benefit of U.S. Provisional Application No. 60/260,595, filed January 9, 2001.</u>

The magnitude of the switch state problem can be estimated as follows. The size of the path table in a typical switch in a connection-oriented network would be M, where M is the mean number of connections passing through that switch, which may be thought of as the density of connections. M would be limited to approximately 10,000, for efficiency and performance. In IP, the number of routes depends on the total number of nodes N in the network, rather than a similar notion of node density, but unlike virtual path indices, IP addresses are interpreted in the course of routing. For example, had the IP (version 4) address space been perfectly aggregated, the entire IP route table would have been simply a distributed binary tree, and the routing decision could have been reduced to 1 bit per router, for a table size of 2 entries and total depth of 32 levels. In reality, IP address assignments have been far from perfect: the initial partitioning of the address space in terms of classes [ensured a] <u>allowed for</u> route table size of [at least] 256 entries, corresponding to $(2^{\log N})^{1/4}=N^{1/4}$, <u>at the bottom level (class A) and $256^2 = 65536$ at the middle level (class B).</u> [and the tables have been further enlarged by] <u>Even with</u> Classless Inter-Domain Routing (CIDR), <u>perfect aggregation cannot be ensured,</u> as noted in the Internet Engineering Task Force (IETF) Request for Comments document RFC2775. There is however, a need for a comparable reduction of switch state volume before connection-oriented networking can become usable on the Internet scale.

One proposed method for dealing with switch state volume is the Multi-Protocol Label Switched (MPLS) architecture, providing for the recursive aggregation of aggregate virtual paths, allowing path labels to be nested in the form of a "label stack". Although the feature appears to be motivated more for switching speed and QoS management, it permits an exponential number of connections to be accommodated at each switch and would reduce the switch state volume to log M. The result [would] <u>could</u> be superior to unaggregated IP in scalability, [assuming] <u>keeping</u> $\log M < N^{1/d}$, [since] <u>given that</u> the size of the Internet, N, will be greater than the capacity of any one switch, M.